

RENEWABLE ELECTRICITY TECHNICIAN



Program Code 10-482-2

Expected Program Costs: \$11,500

Median Annual Salary: \$35,000

OVERVIEW

The Renewable Electricity Technician program will prepare technicians who design, install, operate and maintain solar and wind electricity generating systems for both residential and light commercial applications. Technicians will perform site assessments and integrate new renewable electricity systems with current existing energy sources. Renewable electricity technicians may be involved in the sale or marketing of solar PV and wind energy technologies.

The Renewable Electricity Technician program is offered at the Wisconsin Rapids campus.

PROGRAM OUTCOMES

Employers will expect you, as a Renewable Electricity Technician graduate, to be able to:

- Work safely with renewable electric systems
- Install subsystems and components at the site
- Perform a system checkout and inspection
- Maintain and troubleshoot a system
- Select a system design
- Adapt the mechanical design
- Adapt the electrical design
- Conduct a wind site assessment
- Conduct a solar photovoltaic site assessment

CAREER OPTIONS

Condition Monitoring Technician
Controls Technician
Customer Service Representative
Electrical Workers/Laborers
Measurement Technician
Photovoltaic System Installation, Maintenance and Service Technician
Photovoltaic System Sales Representative
Service Technician
Solar PV Site Assessor
Wind Farm Service Technician
Wind Site Assessor
Wind System Installation, Maintenance and Service Technician
Wind System Sales Representative

POTENTIAL FOR ADVANCEMENT

Electrical Construction Superintendent
Energy Analyst
Journeyman: Electrician
Lead Installer
Master Technician
Project Development Engineer
Project Manager
System Designer

Potential advancement generally requires further education or training.

ADMISSIONS PROCEDURES

To apply to the Renewable Electricity Technician program, please submit the following documents to the MSTC Admissions Office:

1. Complete an MSTC application form and return it with the \$30 non-refundable application fee.
2. Complete the Accuplacer or ACT test. Minimum scores required:
 - Reading-Accuplacer score of 55
 - Sentence Skills-Accuplacer score of 60
 - Math-Accuplacer score of 34
 - ACT equivalents for above scores are acceptable.

If a student does not meet the required test scores, they may retest or complete an identified structured course(s) in the Academic Support Center.

- Written Communication, courses in mathematics and some science courses have placement requirements. Please refer to the course description section in the back of the catalog, listed under General Education, for course specific information.
3. Submit an official copy of all academic transcripts, including high school, college or university and HSED/GED.

**Mid-State Technical College
Admissions
500 32nd Street North
Wisconsin Rapids, WI 54494**

PROGRAM COURSE DESCRIPTION

10001148 // 3 credits

People, Resources and the Sustainability

This course explores the relationship between the human population and natural resources over time, and the effect this relationship has on the biosphere. Global resources, environmental concerns, and the human dimensions of resource management are explored from biological and socioeconomic perspectives.

10103124 // 1 credit

Excel-Intermediate

Develop skill to write and debug macros, create custom menus, perform database functions and develop graphs. *Prerequisite: Microsoft Office-Introduction 10103106 or Excel-Beginning 10103123*

10103106 // 3 credits

Microsoft Office-Introduction

Develops introductory skills in the Microsoft Office Suite (Word, Excel, Access, PowerPoint, and Outlook) while reinforcing the students' knowledge of computer concepts, Windows Explorer and Internet usage through demonstrations and lab exercises. Students should possess basic keyboarding, mouse and Windows XP skills. Students may develop these skills in Academic Support Center computer training prior to enrolling or while concurrently enrolled in the Microsoft Office-Introduction course.

10480100 // 2 credits

Alternative Energy Overview

In this course, students will investigate the need for renewable energy systems and emerging careers in renewable energy. Students will examine the basic design, function, cost, and other considerations associated with various "green" energy systems, including solar photovoltaic, solar thermal, wind, geothermal and biomass. Students will also explore the production and use of alternative transportation fuels.

10480190 // 2 credits

Renewable Energy Internship Student internships provide an opportunity for career success through supervised on-the-job learning experiences.

Through an internship, students will apply subject knowledge learned in the program to the workplace under the direction of an experienced technician. *Prerequisite: Completion of 50% of program credits*

10480195 // 2 credits

Renewable Energy/Energy Conservation-Special Topics

Selected hands-on project in renewable energy/energy conservation requiring students to apply subject knowledge learned in the program. *Prerequisite: Completion of 50% of program credits*

10481100 // 2 credits

Intro to Energy Efficiency & Management

Students in this course will be introduced to the principles of energy management and the energy efficiency industry. Students will learn about the history of energy production and costs, the dynamics of worldwide energy consumption and growth including environmental and financial impacts and consequences. Building energy flows will be described and analyzed. Students will be introduced to the use of building diagnostic tools commonly employed in the industry to identify opportunities for improving energy efficiency. Building design features will be examined for efficiency/management improvements or upgrades.

Prerequisite: Admission to Energy Efficiency Technician 104811, Renewable Electricity Technician 104822, Renewable Energy Specialist 104823, or Renewable Thermal Energy Technician 104831 Program

CURRICULUM

Term (16-17 credits)

10103106	Microsoft Office-Introduction	3
10480100	Alternative Energy Overview	2
10481100	Intro to Energy Efficiency & Management	2
10482100	Intro to Renewable Electricity	2
10605105	Electrical Circuits I	3
-or-		
10605108	Intro to Electronics	2
10623106	Intro to AutoCAD	2
10804107	College Mathematics	3

Term (16 credits)

10001148	People, Resources and the Sustainability	3
10103124	Excel-Intermediate	1
10482101	Solar PV Site Assessor Training	2
10482107	Construction Fundamentals	2
10482110	Photovoltaic System Installation I	2
10801195	Written Communication	3
10801196	Oral/Interpersonal Communication	-or-
10801198	Speech	3

Term (2 credits)

10480190	Renewable Energy Internship	-or-
10480195	Renewable Energy/Energy Conservation-Special Topics	2

Term (17 credits)

10482102	Wind Site Assessor Training	2
10482111	Photovoltaic System Installation II	2
10482116	Stand-Alone Renewable Electric Systems	2
10482120	Wind Systems Installation I	2
10605127	Electrical Machines	3
10809143	Microeconomics	-or-
10809144	Macroeconomics	3
10809198	Intro to Psychology	3

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RENEWABLE ELECTRICITY TECHNICIAN

CURRICULUM

Continued from the previous page

Term	(17 credits)
10482115 Grid-Tied Renewable Electric Systems	2
10482121 Wind Systems Installation II	2
10482150 Advanced Renewable Electric Systems	2
10605117 Programmable Logic Controllers-Beginning	3
10809122 Intro to American Government	3
10809196 Intro to Sociology Elective	3

Total Credits 68-69

Please Note:

- The Renewable Electricity Technician program has an August start date. We advise you to meet with an academic advisor or counselor to successfully plan your academic schedule.
- This curriculum sequence is only for student planning. Actual student schedules will vary depending on course availability.
- Degree completion time may vary based on student scheduling and course availability.
- For General Education course descriptions (800 level), see section marked under Course Descriptions.

10482100 // 2 credits

Intro to Renewable Electricity

Students in this course will learn the basics of renewable electricity generation with particular emphasis on wind and solar energy. Topics will include wind and solar resources, basic system components, system types and applications.

Prerequisite: Admission to Energy Efficiency Technician 104811, Renewable Electricity Technician 104822, Renewable Energy Specialist 104823, or Renewable Thermal Energy Technician 104831 Program

10482101 // 2 credits

Solar PV Site Assessor Training

Students will learn the steps to perform solar PV site assessments of a home or business. Class content will cover: solar window determination, load analysis, site selection, system types, system sizing and efficiency measures, energy output estimation. The course will also cover an overview of existing renewable electric incentive programs and permitting procedures.

Corequisite: Intro to Renewable Electricity 10482100 Program

10482102 // 2 credits

Wind Site Assessor Training

Students will learn the steps to perform wind site assessments of a home or business. Class content will cover: measuring wind energy potential, load analysis, site selection, system types, system sizing and efficiency measures, energy output estimation. The course will also cover an overview of existing renewable electric incentive programs and permitting procedures.

Prerequisite: Intro to Renewable Electricity 10482100

10482107 // 2 credits

Construction Fundamentals

Students will study the concepts associated with the theory, materials, and methods used in construction to include footings and foundations, walls, floors, roofs and roof materials, exterior finishes, interior walls, ceiling and floor finishes, insulation types, vapor and air infiltration, and sound protection. Additionally, students will become familiar with blueprint reading and examine all the trades associated with construction including, electrical, HVAC, and plumbing. The safe use of the appropriate tools for each trade will also be covered.

Prerequisite: Admission to Energy Efficiency Technician 104811, Renewable Electricity Technician 104822, Renewable Energy Specialist 104823, or Renewable Thermal Energy Technician 104831 Program

10482110 // 2 credits

Photovoltaic System Installation I

Students will learn the details involved in the mechanical integration of a PV system. Topics include: system components, product specifications, product integration, racking system design capabilities and limits, system diagramming, configurations, safety, common design mistakes and solutions, installation techniques. This course will involve students in the installation of a photovoltaic system.

Prerequisite: Intro to Renewable Electricity 10482100

10482111 // 2 credits

Photovoltaic System Installation II

This course is a continuation of PV System Installation I. Students will learn the details involved in the electrical integration of a PV system. Topics include: system design capabilities and limits, system diagramming, wiring configurations, safety, National Electrical Code, common design mistakes and solutions, wiring techniques and installation techniques. System maintenance principles will also be covered.

Prerequisite: Photovoltaic System Installation I 10482110; Corequisite: Intro to Electronics 10605108

10482115 // 2 credits

Grid-Tied Renewable Electric Systems

This course will cover Wisconsin's utility interconnect standard, net metering policies and how they relate to photovoltaic and wind installations. This course will also provide an overview of electrical power distribution and transmission networks along with metering techniques. Class will consist of both bench-top and field maintenance grid-tied renewable electric systems.
Prerequisite: Photovoltaic System Installation II 10482111; Corequisite: Intro to Electronics 10605108

10482116 // 2 credits

Stand-Alone Renewable Electric Systems

This course will cover stand-alone systems for both wind and PV renewable electric systems. Topics include: battery types and their specific uses, battery bank sizing and configuration, along with safety, maintenance, and components related to stand-alone systems.
Corequisite: Photovoltaic System Installation II 10482111

10482120 // 2 credits

Wind Systems Installation I

This course will involve students in the installation of a tilt up tower. Topics include safety, system design, layout, and turbine performance.
Corequisite: Wind Site Assessor 10482102

10482121 // 2 credits

Wind Systems Installation II

This course is a continuation of Wind System Installation I and will involve students in the electrical integration of a wind system. Topics include: National Electrical Code, component selection, wiring techniques, installation techniques, and troubleshooting techniques including both bench-top and field maintenance of wind turbines.
Prerequisite: Wind Systems Installation I 10482120; Electrical Machines 10605127

10482150 // 2 credits

Advanced Renewable Electric Systems

This course will explore advanced renewable electric system designs including hybrid renewable electric systems, bimodal renewable electric systems, and micro hydro systems along with integration and interaction of multiple system types. Students will complete a capstone project during the course.
Prerequisite: Successful completion of 12 credits of Renewable Electric (10-482) coursework.

10605108 // 2 credits

Intro to Electronics

This course presents a survey of electricity and electronics which includes lab activities and is designed for persons wishing to learn some of the basics of electricity and electronics. It is an excellent refresher course to get back into electronics or improve a skills list. The course is intended for persons where electronics has become a part of their regular occupation and a need exists to identify various electronic components and perform basic tests using test equipment such as multimeters and oscilloscopes. The course covers concepts and applications of DC and AC electricity, semiconductor components, and digital devices using basic math skills.

10605117 // 3 credits

Programmable Logic Controllers-Beginning

An overview of programmable logic controllers (PLC's) which provides a foundation of knowledge of the programming techniques, operation and maintenance of PLC's used in typical industrial automation.

10605127 // 3 credits

Electrical Machines

Designed to teach fundamentals of generators and motors. Covers DC and AC generators and motors.
Prerequisite: Electrical Circuits I 10605105 or Intro to Electronics 10605108

10623106 // 2 credits

Intro to AutoCAD

This is an introductory course in computer aided drafting (CAD) using AutoCAD software. It will provide foundation skills in using CAD software to create and print two dimensional technical drawings. This course is available to students in any program. Computer skills and prior knowledge of drawing/drafting techniques is recommended.